Technical Information

CC0-CHILLOUT • LPC Super-I/O Board

Document No. 3254 • Edition 5

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About this Manual

This manual is a short form description of the technical aspects of the CC0-CHILLOUT, required for installation and system integration. It is intended for the very advanced user only.

Edition History

EKF Document	Ed.	Contents/*Changes*	Author	Date
Text # 3254 cc0_tie.wpd	1	Technical Information CC0-CHILLOUT English Preliminary edition, to be completed later on	jj	6. Nov 03
	2	Added table P11 (opt. MIDI header)	jj	24. Nov 03
	3	Changed elements in table J1 (rear I/O connector), regarding rows 7...3 (DVI connector handover)	jj	18 December 2003
	4	Added MTBF	jj	23 April 2004
	5	Added block diagram CCZ-RIO	jj	7 May 2004

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Related Documents

For a description of the CPU card, which acts as a LPC controller and carrier board with respect to the CC0-CHILLOUT, please refer to the correspondent CPU user guide, available by download at http://www.ekf.de/c/ccpu/ccpu.html.

Nomenclature

Signal names used herein with an attached '#' designate active low lines.

Trade Marks

Some terms used herein are property of their respective owners, e.g.

Pentium, Celeron: ® Intel
CompactPCI : ® PICMG
Windows 98, Windows NT, Windows 2000, Windows XP: ® Microsoft

EKF does not claim this list to be complete.

Legal Disclaimer - Liability Exclusion

This manual has been edited as carefully as possible. We apologize for any potential mistake. Information provided herein is designated exclusively to the proficient user (system integrator, engineer). EKF can accept no responsibility for any damage caused by the use of this manual.

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CC0-CHILLOUT Features

Feature Summary	
Form Factor	Single size Eurocard (160x100mm^2), front panel width 4HP (20.3mm)
LPC Super-I/O Chip	LPC47B27x, parallel port, 2 serial ports, floppy drive controller port, keyboard controller & mouse port, infrared port, MIDI/gameport, fan control ports, GPIOs, serial IRQs
Front Panel Connectors	No front panel connectors are provided on the CC0-CHILLOUT, use the CC6-ACID instead if front panel I/O is required
On-Board Connectors [1]	LPC Interface, IDE/ATA 40-pin header 2.54mm, IDE/ATA 44-pin header 2.00mm, floppy disk header 34-pin 2.54mm, floppy disk 26-pos. ZIF socket, floppy disk power, 2 x fan heatsink header (pulse width modulation), 2 x fan heatsink header (tacho generator), MIDI/gameport header
Rear I/O Connectors	J1: IDE, PS/2 KB/MS, RJ45 Ethernet [2], Video analog/digital [2] J2: Serial1/COM1, Serial2/COM2, LPT, floppy disk, USB [2], GPIO, IRDA
On-Board Functions	Speaker, IDE activity, optional LEDs: GPIO21, GPIO22, GPIO43, GPIO60, GPIO61, 3.3V, 5V, 12V
Hard Disk Option	Hard disk drive 2.5-inch optional on-board
MTBF	0.185 * 10^6h

[1] Not all of these connectors may be present on your actual CC0-CHILLOUT board. Assembly of these connectors is highly custom specific. Discuss your needs with EKF before ordering.

[2] Available as an option only, which requires also the CPU carrier board to be assembled custom specific, for passing the related signals to the CC0-CHILLOUT by board-to-board stackers.

Subject to changes

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Short Description

Available as a companion board to the CC2-TANGO, CC5-RAVE, CC7-JAZZ and the CC8-BLUES CPU cards, the CC0-CHILLOUT is provided with common legacy I/O ports. Interconnection between the CC0 I/O module and the CPU carrier board is achieved by the LPC (Low Pin Count) interface.

As an option, the CC0-CHILLOUT is available with a rugged on-board 2.5-inch hard disk drive.

The CC0-CHILLOUT has been designed for rear I/O and therefore requires a non-bussed single-slot P1/P2 backplane in addition to the CompactPCI bus. However, if front panel I/O is preferred, the CC6-ACID should be used instead.

Typically, the CC0-CHILLOUT shares an 8HP front panel together with the associated CPU carrier board. Therefore the chosen CPU board and the CC0 should be ordered as an integral unit.

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The CC0-CHILLOUT communicates to the host CPU by means of the LPC interface. This is a multiplexed ISA bus, enabling the super-I/O controller chip to emulate the legacy I/O interfaces. Among these are parallel and serial ports, the PS/2 interfaces, and last not least the classic 1.4/2.8MB floppy disk controller. As an option, the CC0-CHILLOUT provides MIDI and gameport attachment, and control outputs for fans with either tachometer output or pulse width modulation input.

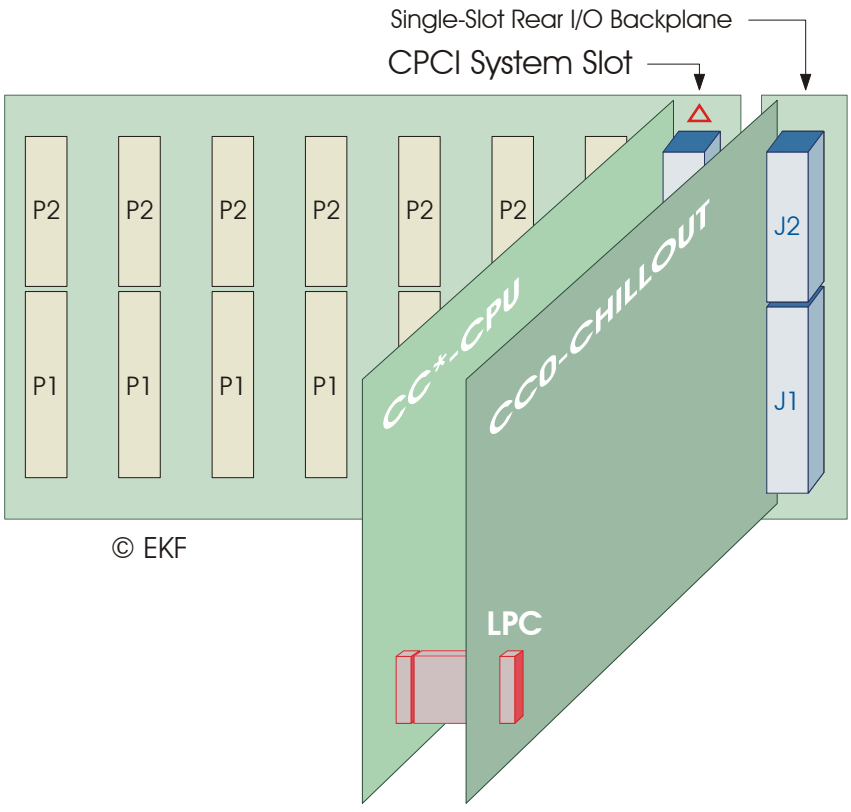
By connecting the boards together, the hosts ATA/IDE interface is also available on the CC0-CHILLOUT. Optionally, the board is equipped with a robust 2.5-inch hard disk drive, particularly suited for use in a rugged environment.

The CC0-CHILLOUT can be mounted either on the left (bottom) side of the CPU board, or right (top) side. Specify your actual needs when ordering the unit.

Most of the functions of the CC0-CHILLOUT are available for rear I/O across the connectors J1/P1. A suitable rear I/O transition module would be required in addition in order to gain access to the I/O ports from the systems back panel.

Several I/O functions are also directly available by on-board headers on the CC0, mainly the IDE and FD interfaces. Most of the on-board connectors are only stuffed as an option, however.

The CC0-CHILLOUT must be inserted on a slot outside of the CompactPCI backplane. A single slot rear I/O P1/P2 backplane should be present in the system rack at the CC0 reserved slot. Most EKF systems have the CPCI busprint justified to the left margin of the 19-inch rack, with the system slot (CPU slot) orientated to the right end of the backplane. Following next to the right side, the CC0-CHILLOUT should be placed in between the remaining free mounting space.



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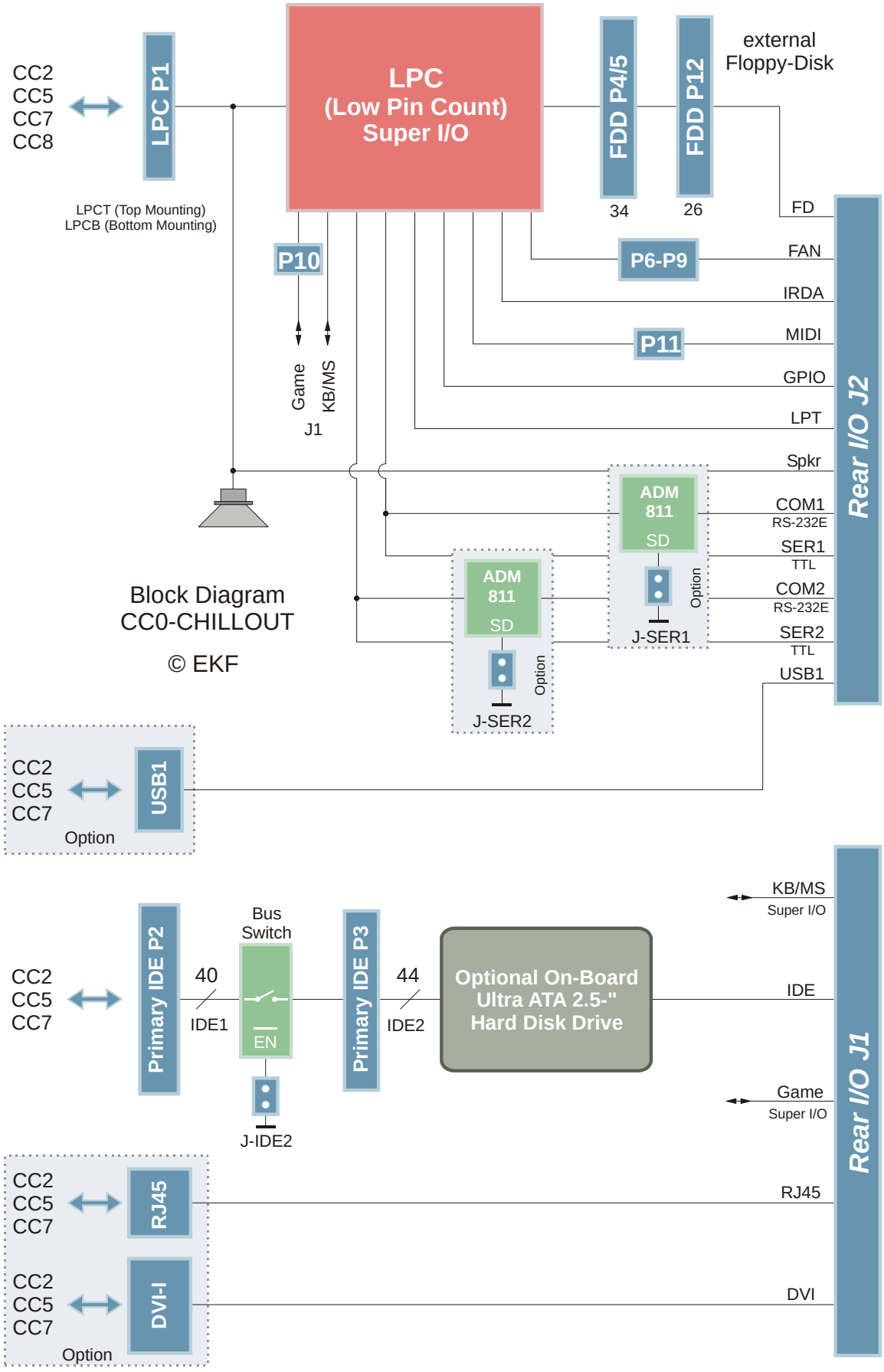
Block Diagram CC0-CHILLOUT



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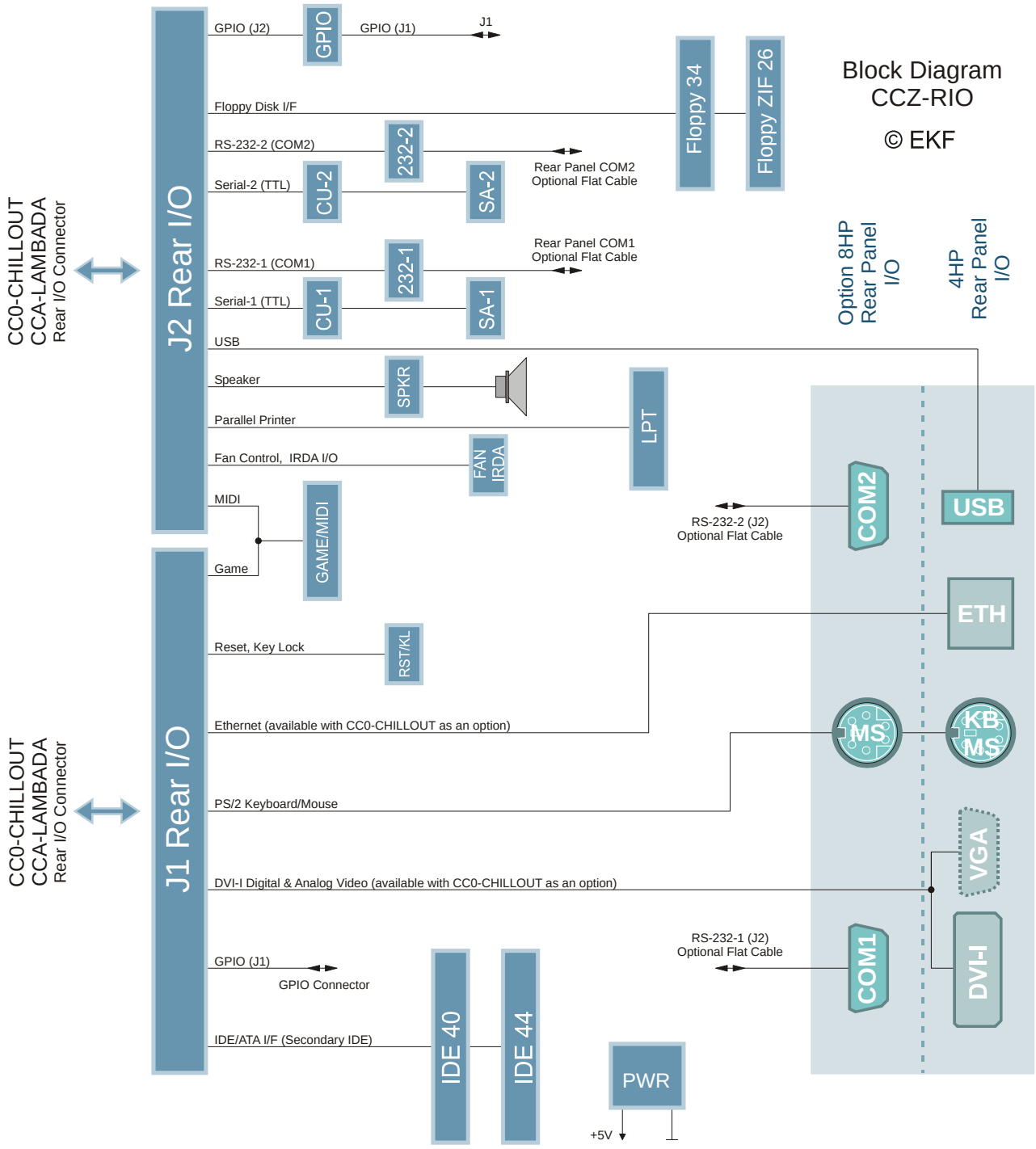
Block Diagram CCZ-RIO



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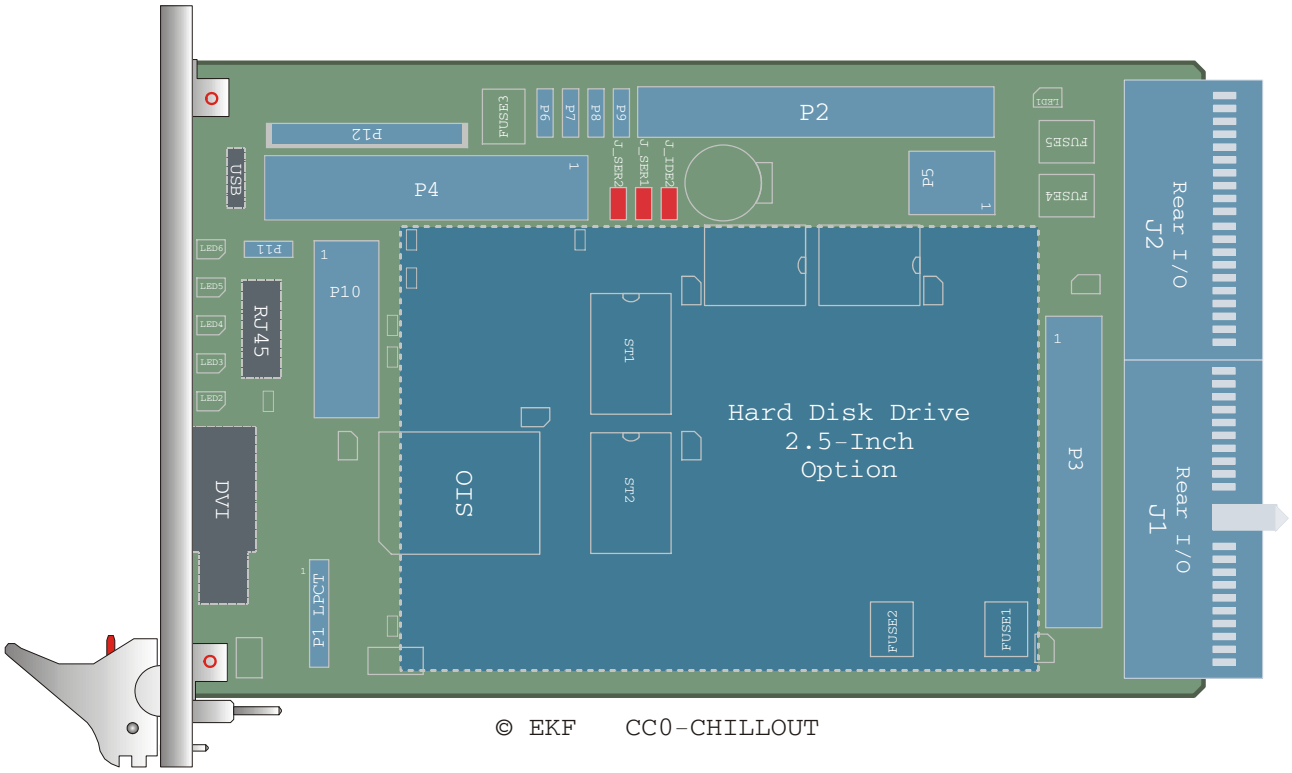
Top View Component Assembly



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On-Board Connectors

P1	LPC Low Pin Count interface
P2	IDE 40-pin header
P3	IDE 44-pin header
P4	Floppy disk header 34-pin
P5	Floppy disk power (opt.)
P6..P9	Fan heatsink headers (opt.)
P10	MIDI/gameport header (opt.)
P11	Midi header (opt.)
P12	Floppy disk header 26-pos. ZIF
J1	Rear I/O metric connector 5 x 25 brown key
J2	Rear I/O metric connector 5 x 22
DVI	Re-routing of host CPU front panel video connector analog/digital (opt. stacker)
RJ45	Re-routing of host CPU front panel Ethernet connector (opt. stacker)
USB	Re-routing of host CPU USB front panel connector (opt. stacker)

Front Panel Connectors

	No front panel connectors available with the CC0-CHILLOUT Make use of the CC6-ACID instead if front panel I/O is required

Jumpers

J-IDE2	Enables IDE bus switches when set Please note: In order to make use of the header P3 (IDE interface for 2.5-inch hard disk) or rear I/O IDE across J1, either connected to an on-board HDD or an external drive, the jumper J-IDE must be set. However, if neither P3 nor J1 is in use, J-IDE must be removed in order to avoid reflections on the IDE bus caused by tapped signal traces.
J-SER1	Enables the optional RS-232 transceiver (COM1) when set If removed, the transceiver is in a high-impedance shutdown mode
J-SER2	Enables the optional RS-232 transceiver (COM2) when set If removed, the transceiver is in a high-impedance shutdown mode

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Installing and Replacing Components

Before You Begin

Warnings

The procedures in this chapter assume familiarity with the general terminology associated with industrial electronics and with safety practices and regulatory compliance required for using and modifying electronic equipment. Disconnect the system from its power source and from any telecommunication links, networks or modems before performing any of the procedures described in this chapter. Failure to disconnect power, or telecommunication links before you open the system or perform any procedures can result in personal injury or equipment damage. Some parts of the system can continue to operate even though the power switch is in its off state.

Caution

Electrostatic discharge (ESD) can damage components. Perform the procedures described in this chapter only at an ESD workstation. If such a station is not available, you can provide some ESD protection by wearing an antistatic wrist strap and attaching it to a metal part of the system chassis or board front panel. Store the board only in its original ESD protected packaging. Retain the original packaging (antistatic bag and antistatic box) in case of returning the board to EKF for rapair.

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Installing the Board

Warning

This procedure should be done only by qualified technical personnel. Disconnect the system from its power source before doing the procedures described here. Failure to disconnect power, or telecommunication links before you open the system or perform any procedures can result in personal injury or equipment damage.

Typically you will perform the following steps:

- Switch off the system, remove the AC power cord
- Attach your antistatic wrist strap to a metallic part of the system
- Remove the board packaging, be sure to touch the board only at the front panel
- Identify the related CompactPCI slot (peripheral slot for I/O boards, system slot for CPU boards, with the system slot typically most right or most left to the backplane)
- Insert card carefully (be sure not to damage components mounted on the bottom side of the board by scratching neighboured front panels)
- A card with onboard connectors requires attachment of associated cabling now
- Lock the ejector lever, fix screws at the front panel (top/bottom)
- Retain original packaging in case of return

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Removing the Board

Warning

This procedure should be done only by qualified technical personnel. Disconnect the system from its power source before doing the procedures described here. Failure to disconnect power, or telecommunication links before you open the system or perform any procedures can result in personal injury or equipment damage.

Typically you will perform the following steps:

- Switch off the system, remove the AC power cord
- Attach your antistatic wrist strap to a metallic part of the system
- Identify the board, be sure to touch the board only at the front panel
- unfasten both front panel screws (top/bottom), unlock the ejector lever
- Remove any onboard cabling assembly
- Activate the ejector lever
- Remove the card carefully (be sure not to damage components mounted on the bottom side of the board by scratching neighboured front panels)
- Store board in the original packaging, do not touch any components, hold the board at the front panel only

Warning

Do not expose the card to fire. Battery cells and other components could explode and cause personal injury.

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EMC Recommendations

CE

In order to comply with the CE regulations for EMC, it is mandatory to observe the following rules:

- The chassis or rack including other boards in use must comply entirely with CE
- Close all board slots not in use with a blind front panel
- Front panels must be fastened by built-in screws
- Cover any unused front panel mounted connector with a shielding cap
- External communications cable assemblies must be shielded (shield connected only at one end of the cable)
- Use ferrite beads for cabling wherever appropriate
- Some connectors may require additional isolating parts (e.g. 10Base-2 BNC T-connector)

Reccomended Accessories

Blind CPCI Front Panels	EKF Elektronik	Widths currently available (1HP=5.08mm): with handle 4HP/8HP without handle 2HP/4HP/8HP/10HP/12HP
Ferrit Bead Filters	ARP Datacom, 63115 Dietzenbach	Ordering No. 102 820 (cable diameter 6.5mm) 102 821 (cable diameter 10.0mm) 102 822 (cable diameter 13.0mm)
Isolating Elements	ARP Datacom, 63115 Dietzenbach	Ordering No. 182 068 (Cheapernet T-connector)
Metal Shielding Caps	Conec-Polytronic, 59557 Lippstadt	Ordering No. CDFA 09 165 X 13129 X (DB9) CDSFA 15 165 X 12979 X (DB15) CDSFA 25 165 X 12989 X (DB25)

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Technical Reference - Connectors

Caution

Some of the connectors provide operating voltage (e.g. 5V and 12V) to devices inside the system chassis, such as fans and internal peripherals. Not all of these connectors are overcurrent protected. Do not use these connectors for powering devices external to the computer chassis. A fault in the load presented by the external devices could cause damage to the board, the interconnecting cable and the external devices themselves.

Please Note

The CC0-CHILLOUT transition module may be equipped with several on-board connectors for system internal usage. Not all of these connectors may be present on a particular board. Be sure to specify your individual needs when ordering the CC0 board. Characteristic features and the pin assignments of each connector are described on the following pages (connector designation in alphabetical order).

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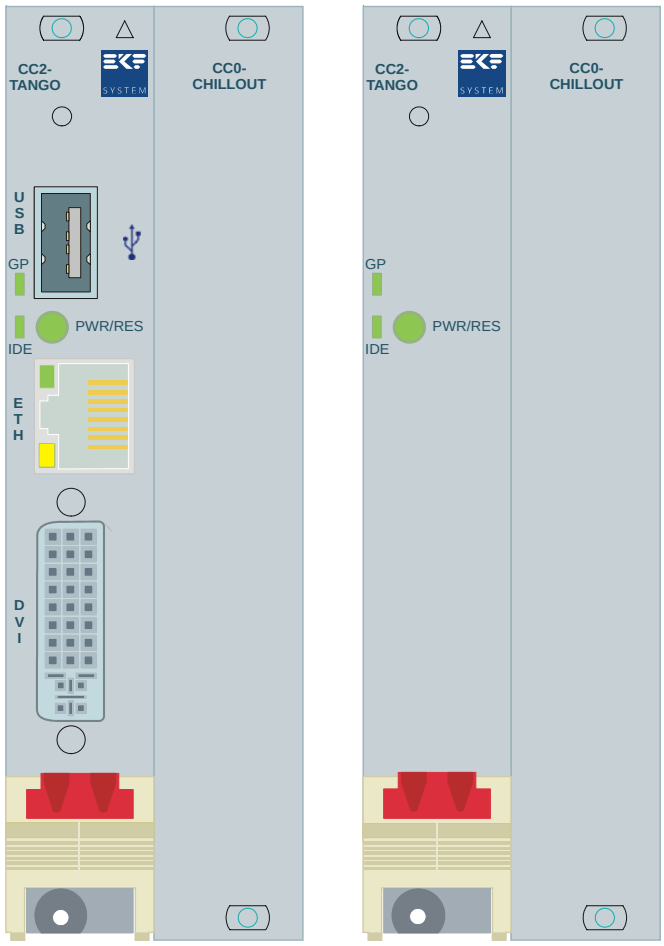
Front Panel Connectors

By default, the CC0-CHILLOUT shares a common 8HP (40.6mm) front panel with the associated CPU board. This assembly forms a robust unit for rugged conditions. No front panel I/O is available for the CC0-CHILLOUT, because the CC0 has been designed exclusively for rear I/O. Alternatively the CC6-ACID is available, providing front panel I/O.

The front panel I/O connectors of the respective CPU board remain unviolated unless the user requires to redirect also the video connector (DVI-I analog/digital), the Ethernet connector, and the USB1 connector. If redirection for these ports has been ordered as an assembly option, these connectors are no longer available from the front panel.

As of current, suitable CPU cards for use with the CC0-CHILLOUT are the CC2-TANGO, CC5-RAVE, CC7-JAZZ and (partially) the CC8-BLUES.



CC0/CC2 Front Panel w/o & with Redirection

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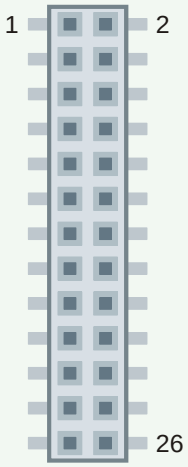
LPC Connector P1

The LPC connector P1 is mounted either on top, on bottom, or on both sides of the CC0-CHILLOUT PCB. This allows to attach the CC0 either on top (EKF standard) or on bottom of the CPU carrier board.



1.27mm Socket

P1 (LPT) 1.27mm Socket 2 x 13			
GND	1	2	pciclk
GND	3	4	lad0
GND	5	6	lad1
GND	7	8	lad2
GND	9	10	lad3
GND	11	12	lframe#
GND	13	14	ldrq#
serirq	15	16	lpme#
lsmi#	17	18	pcirst#
+5V	19	20	+3.3V
rcin#	21	22	a20gate
+12V [1]	23	24	+3.3V
sio_clk14	25	26	speaker

[1] +12V is not in use on most CPU boards. If required for fan power, +12V could be supplied alternatively across P5.

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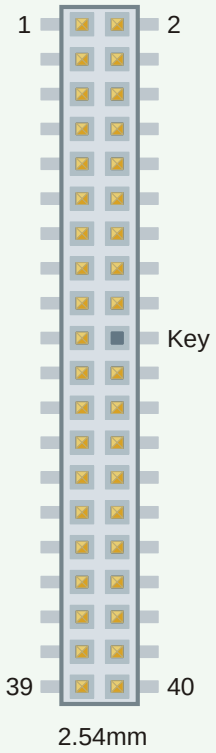
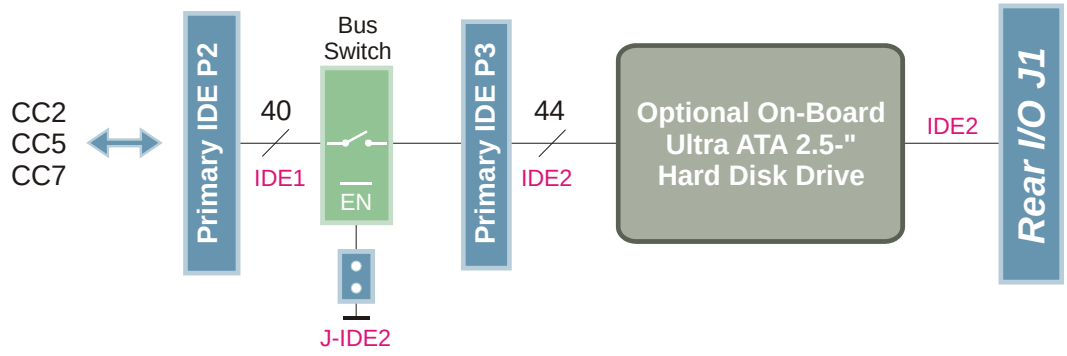
IDE/ATA Connector P2



P2 (2.54mm Dual Row Pin Header)			
reset#	1	2	GND
d07	3	4	d08
d06	5	6	d09
d05	7	8	d10
d04	9	10	d11
d03	11	12	d12
d02	13	14	d13
d01	15	16	d14
d00	17	18	d15
GND	19	*20*	KEY
dmarq	21	22	GND
iow#	23	24	GND
ior#	25	26	GND
iordy	27	28	
dmack#	29	30	GND
intrq	31	32	
a1	33	34	cblid#
a0	35	36	a2
cs1#	37	38	cs3#
act#	39	40	GND

P2 is provided for attachment of classic IDE devices (e.g. 3.5-" hard disk drive, DVD-ROM). Usage of the IDE connector P2 requires the IDE bus switches disabled (jumper J-IDE2 removed). No stubs are allowed on an IDE cable assembly, i.e. use either P2 (J-IDE2 removed), or P3 (J-IDE2 set), or rear I/O IDE (J-IDE2 set).



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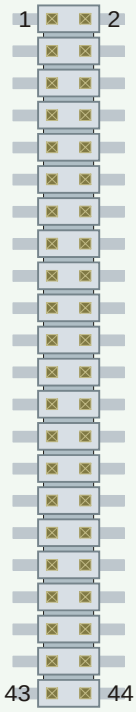
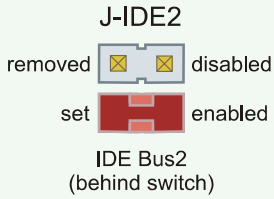
IDE/ATA Connector P3





P3 (2.00mm Header)			
reset#	1	2	GND
d07	3	4	d08
d06	5	6	d09
d05	7	8	d10
d04	9	10	d11
d03	11	12	d12
d02	13	14	d13
d01	15	16	d14
d00	17	18	d15
GND	19	*20*	KEY
dmarq	21	22	GND
iow#	23	24	GND
ior#	25	26	GND
iordy	27	28	NC
dmack#	29	30	GND
intrq	31	32	NC
a1	33	34	cblid#
a0	35	36	a2
cs1#	37	38	cs3#
act#	39	40	GND
drvpwr	41	42	drvpwr
GND	43	44	NC

P3 is provided for a 2.5-" on-board hard disk drive. Either usage of the IDE connector P3, or rear I/O IDE across connector J1 require the IDE bus switches enabled (jumper J-IDE2 set). No stubs are allowed on a IDE cable assembly, i.e. exclusively use either P2 (J-IDE2 removed), or P3 (J-IDE2 set), or rear I/O IDE (J-IDE2 set).

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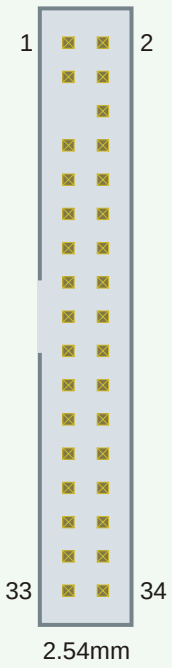
Floppy Disk Connector P4

P4 (2.54mm Header)				
	GND	1	2	drvden0#
	GND	3	4	NC
	KEY	*5*	6	drvden1#
	GND	7	8	index#
	GND	9	10	mtr0#
	GND	11	12	NC
	GND	13	14	ds0#
	GND	15	16	NC
	GND	17	18	dir#
	GND	19	20	step#
	GND	21	22	wdata#
	GND	23	24	wgate#
	GND	25	26	trk0#
	GND	27	28	wrtprt#
	NC	29	30	rdata#
	GND	31	32	hdsel#
	NC	33	34	dskchg#

The CC0-CHILLOUT is provided with a 34-pin header, suitable for attachment of a single floppy disk drive with mating connector.

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Power Connector P5

P5		
AMP 171826-4	1	+5V/1.25A
	2	GND
	3	GND
	4	+12V/1.25A

The initial purpose of the optional connector P5 was to deliver +5V power to an attached floppy disk drive wired to P4. A suitable cable assembly matching the AMP 171826-4 would be required. Alternatively, P5 can be used to pass +5V and +12V redundantly (in addition to the LPC connector P1) to the CC0-CHILLOUT, which can improve the power distribution when an on-board hard disk drive is in use (especially if a pair of drives is connected to P3). The current across P5 is limited by resettable fuses.

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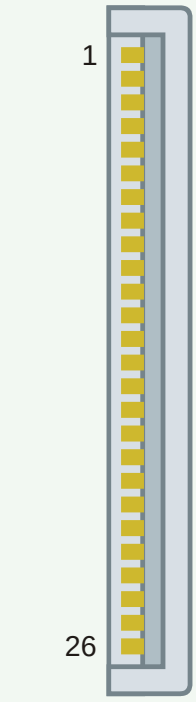
Micro Floppy Disc Connector P12

P12 (1mm ZIF Receptacle)		
 1mm pitch FFC/FPC receptacle vertical ZIF 26-position	1	+5V
	2	index#
	3	+5V
	4	ds0#
	5	+5V
	6	dskchg#
	7	NC
	8	NC
	9	drvden0#
	10	mtr0#
	11	NC
	12	dir#
	13	modsel
	14	step#
	15	GND
	16	wdata#
	17	GND
	18	wgate#
	19	GND
	20	trk0#
	21	NC
	22	wrtprt#
	23	GND
	24	rdata#
	25	GND
	26	hdsel#

In addition to P4, the CC0-CHILLOUT is also provided with a 26-position FFC/FPC ZIF socket, suitable for attachment of a single floppy disk drive with mating connector (typically low profile drives, e.g. TEAC FD05HF5630, Y-E Data YD-702J-6637, Citizen X1DE-00R, Mitsumi D353F3, Samsung SFD-321S, NEC FD1238H).

You may chose either the P4 connector or P12, but not both simultaneously.

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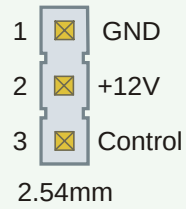
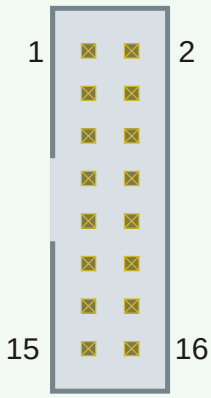
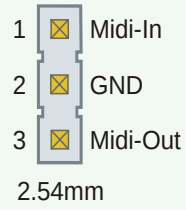
Fan Heatsink Header P6..P9

P6 - P9 (2.54mm Pin Row)		
	1	GND
	2	+12V
	3	Tachometer (P6/P7) Pulse Width Modulation (P8/P9)

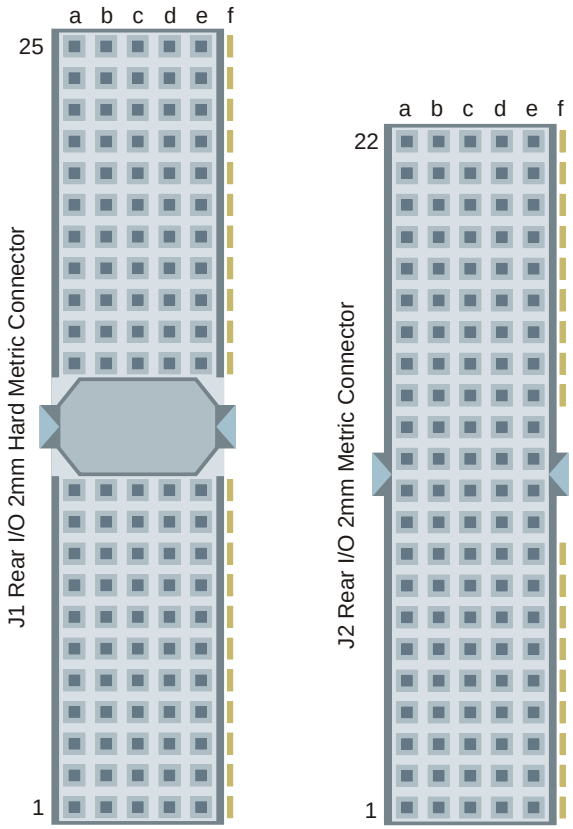
MIDI/Gameport Header P10

P10 (2.54mm Header)				
	5V	1	2	5V
	joy1but1	3	4	joy2but1
	joy1x	5	6	joy2x
	GND	7	8	midi_out
	GND	9	10	joy2y
	joy1y	11	12	joy2but2
	joy1but2	13	14	midi_in
	GND	15	16	NC

MIDI Header P11

P11 (2.54mm Pin Row)		
	1	MIDI-IN
	2	GND
	3	MIDI-OUT

Rear I/O J1/J2



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#J1	A	B	C	D	E
25	+5V			+3.3V	+5V
24	IDE_d08	+5V	VI/O	IDE_reset#	IDE_d07
23	+3.3V	IDE_d09	IDE_d10	+5V	IDE_d06
22	IDE_d11	GND	+3.3V	IDE_d04	IDE_d05
21	+3.3V	IDE_d12	IDE_d13	M66EN (GND)	IDE_d03
20	IDE_d14	GND	VI/O	IDE_d01	IDE_d02
19	+3.3V	IDE_d15	IDE_dmarq	GND	IDE_d00
18	IDE_dmack#	GND	+3.3V	IDE_ior#	IDE_iow#
17	+3.3V	IDE_a1	IDE_cblid#	GND	IDE_iordy
16	IDE_a2	GND	VI/O	IDE_a0	IDE_intrq
15	+3.3V	IDE_cs1#	IDE_act#	GND	IDE_cs0#
14					
13			KEY (BROWN)		
12					
11	RJ45_1	RJ45_2	RJ45_3	GND	KB_dat
10	RJ45_4	GND	+3.3V	RJ45_5	KB_clk
9	RJ45_6	RJ45_7	RJ45_8	GND	MS_dat
8	RJ45_9	GND	VI/O	RJ45_10	MS_clk
7	DVI_17	DVI_9	DVI_10	GND	+5V_km
6	DVI_18	GND	+3.3V	DVI_1	DVI_2
5	DVI_24	DVI_23	DVI_6	GND	DVI_14
4	DVI_C2	GND	VI/O	DVI_16	DVI_7
3	DVI_C4	DVI_C3	DVI_C1	+5V	DVI_8
2	GAME_but11	+5V	GAME_but12	GAME_joy1x	GAME_joy1y
1	+5V	-12V	keylock#	+12V	+5V

pin positions coloured gray: not connected

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#J2	A	B	C	D	E
22	GPIO21	GPIO22	GPIO43	GPIO60	GPIO61
21	COM1_ri	GND	COM2_ri	COM2_cts	FD_drvden0#
20	COM1_cts	GND	COM2_rxd	GND	FD_drvden1#
19	GND	GND	COM2_dsr	COM2_dcd	FD_index#
18	COM1_rxd	COM1_dsr	COM2_dtr	GND	FD_mtr0#
17	COM1_dcd	GND	COM2_rts	COM2_txd	FD_ds0#
16	COM1_dtr	COM1_rts	SER2_ri	GND	FD_dir#
15	COM1_txd	GND	SER2_cts	SER2_rxd	FD_step#
14	SER1_ri	SER1_cts	SER2_dsr	GND	FD_wdata#
13	SER1_rxd	GND	V(I/O)	SER2_dcd	FD_wgate#
12	SER1_dsr	SER1_dcd	SER2_dtr	GND	FD_trk0#
11	SER1_dtr	GND	V(I/O)	SER2_rts	FD_wrtprt#
10	SER1_rts	SER1_txd	SER2_txd	GND	FD_rdata#
9	SER1_shdn	GND	V(I/O)	SER2_shdn	FD_hdsel#
8	LPT_slct	LPT_pe	LPT_busy	GND	FD_dskchg#
7	LPT_ack#	GND	V(I/O)	USB1_d+	USB1_d-
6	LPT_d7	LPT_d6	LPT_d5	USB_GND	+5V_usb1
5	LPT_d4	GND	V(I/O)	MIDI_out	MIDI_in
4	V(I/O)	LPT_d3	LPT_slctin#	GND	speaker
3	LPT_d2	GND	LPT_init#	IRDA_tx	IRDA_rx
2	LPT_d1	LPT_error#	LPT_d0	FAN_tach2	FAN_tach1
1	LPT_alf#	GND	LPT_strobe#	FAN_pwm2	FAN_pwm1

pin positions coloured gray: not connected

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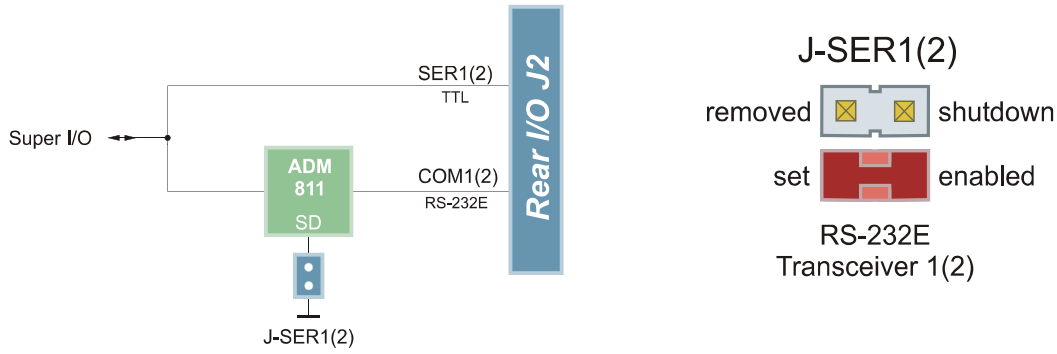
RS-232E Transceivers

The Super-I/O chip provides two asynchronous serial ports (TTL level), which are passed via the J2 rear I/O connector to a rear I/O transition module.

Furthermore, the CC0-CHILLOUT is optionally provided with two serial transceivers according to RS-232E. As with the TTL level serial port signals, also the RS-232 transmission lines are wired to the J2 rear I/O connector for usage on a transition module (back panel COM port connectors). Each transceiver can be individually disabled by the jumpers J-SER1 and J-SER2, if either the particular RS-232 interface is not at all required (with a power saving effect), or if a different interface type is required, e.g. EIA/TIA-485 or optically isolated RS-232 (physical transceivers located on the rear I/O transition module, attached to the TTL level signals).



Conclusion: Each on-board transceiver on the CC0-CHILLOUT must be enabled by setting its associated jumper J-SERx in order to use the COMx rear panel connector(s). If however the serial TTL lines are needed for a special interface solution, the particular on-board transceiver(s) must be disabled by removing its jumper J-SERx.

Power Supply Requirements

Operating Voltage	max. Current
+5V / ±0.25V	TBD
+3.3V / ±0.1V	TBD
+12V / ±0.5V	TBD

Schematics

Complete circuit diagrams for this product are available for customers on request. Signing of a non-disclosure agreement would be needed. Please contact sales@ekf.de for details.

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